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The vegetable garden.

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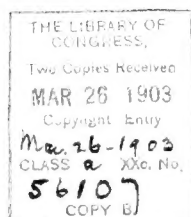
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The **VEGETABLE GARDEN**

By John Elliott Morse



A VALUABLE and HELPFUL BOOK
for Everyone Who has a Garden



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The Vegetable Garden

WHAT TO PLANT AND HOW TO PLANT IT



CHAPTER I.

LOCATION—SOIL—FERTILIZER.

Location. In the city and suburban home, the matter of location becomes one of necessity rather than choice. The rural districts, by virtue of broader areas and magnificent distances, are able to make this more a servant of choice. As this work deals largely with the former two conditions, we must take what we have, and, Napoleon-like, make conditions. Taking then, what we have to work with, the study will be to direct our efforts in the most effective manner possible. If then any choice of location is possible, let it be the warmest, sunniest spot available. An east to southern exposure is best, with just as little of shade or other obstacles as possible. The all-day sun, with longest distance of the garden plot north and south, is what we like, or if possible, the rows should run in that direction for best possible benefit from the sun's rays. If such a choice is not available do not be discouraged, but take the next best and see what well directed effort will accomplish with even indifferent surroundings. Be sure to have the garden anyway whether round, square or crooked.

Soil. The ideal soil would be, of course, the rich clay or sand loam, but I have seen the sandy waste of back yard or the hard sterile clay heap made to blossom as the rose. In fact, I have never seen the back-yard barriers that entirely defied well directed, energetic effort.

The practical things to consider are first, what is our soil, and what are its needs. Is it heavy clay soil, wet and retentive? Then if possible, open it up with under drains, to draw off the water and admit the air. Wood ashes, leached or unleached, will assist much in mellowing such soils. Manure, coarse or fine will also assist in this, and will add the necessary humus or decayed vegetable matter, which we must have in any soil for best results. Any variation of clay soil, from the heaviest to clay loam, will be benefited by this treatment. Gravelly soils must have the humus which is furnished by vegetable matter of almost any sort, as stable manure, straw, etc., anything that will decay and leave its substance in the ground. Wood ashes, lime, or even clay soil or the street cleanings, all are good. Sandy soil, varying from loam to the lightest sand, must first have the humus, and after that, lime or ashes or both. The latter will act as a binder to hold the soil together, enabling it the better to withstand the drouth. Clay, muck or marl thickly applied will also be valuable.

The three principal soils then, which nature furnishes, are: first, clay, varying through different textures to the clay loam; second, sandy soil, varying from the lightest sand to heavy loam; third, gravelly soil, varying from clay or sandy mixture to loam. With these points in view, it is comparatively easy to determine what should be the best treatment of our individual soils. Remembering that humus or decayed vegetable matter is indispensable, and if lacking must be supplied, then our general treatment must be to break up and mellow the harder soils by means as stated above, and to bind together and unify the lighter soils as also indicated.

Fertilizers. There are four elements with which we can in no way dispense in successful gardening, viz: humus, nitrogen, phosphoric acid and potash. Humus or vegetable matter has its own peculiar and all-important offices in plant life economics. The first is that of correcting or balancing up the deficiencies or shortages of soils varying from light soil to heavy clay. The second and most highly important office is that of controlling the absorption and evaporation of water or moisture. It will be seen then that humus is indispensable, and the most economical way of supplying it is through the application of barnyard manure.

The humus, then, may be said to be the great controller of the moisture supply. The other three, nitrogen, phosphoric acid and potash are the life-giving necessities or elements upon which the plant must feed. These in general are most easily and naturally supplied by stable manure. Lacking this, however, in reasonable supply, or good quality, then the deficiencies are most easily supplied by nitrate of soda, bone meal or phosphate and potash. The latter is most easily and cheaply supplied by hard wood ashes.

CHAPTER II.

HOT BEDS AND COLD FRAMES.

Directions for making the most approved kinds will be found below, which may be varied according to circumstances. The most convenient size of sash is five feet six inches by three feet two inches, which may be made at any sash and blind factory. This size of sash will require four rows 8x10 glass, $6\frac{1}{2}$ panes to the row, or 26 in all, and about four pounds of putty. Before glazing, the sash should be primed with white lead and oil, about one pound of lead to one quart of oil, or better still, white lead and yellow ochre equal parts, as it makes a more lasting body than the lead alone. For the priming coat paint thoroughly but thinly, as it is the oil and not the filler that is required to hold putty firmly. In laying the glass, begin at the lower or level end of the sash, lapping the first glass not less than a full half inch onto the sash rail. Lay the glass crowning side up and lap each glass a full quarter inch, as shingles are laid, only with less lap. Tack each glass firmly in place with zinc points, or, preferably, small brads. The putty should be as soft as possible, as when once set, it will adhere much more firmly than if applied too stiff. After the putty is set paint the sash with two coats, same as the priming coat, only four to five pounds of the lead and ochre should be used to the quart of oil. Paint thoroughly as it will pay many times over in the wear of the sash. The cost of the sash at present high price of material, will be upwards of \$2.00 each, ready for use, exclusive of labor of painting and glazing. The labor, however, may be done at odd times by any man, woman or handy boy, by following carefully the directions. Four sash of the above size will cover a box 12 feet eight inches by five feet six inches, and its capabilities if properly managed will be a revelation to the uninitiated.

The higher side of the bed should be 18 inches in height, and the lower side 12 inches, giving six inches slant, which is none too much. Each side should have three 2x4 posts, cut four inches longer than the height of the respective sides, and the tops of the posts should be cut the same slant as the top of the bed. With the side boards nailed to the top of the posts the bed when completed and set up will be four inches above the ground, which permits the posts to be settled into the ground somewhat, and also gives more space for manure and economizes in lumber. A board 12 inches wide by five feet six inches in length, sawed cornerwise from end to end, will make the slanting end pieces and the remainder of the ends may then be filled with any width of board convenient. Three cross pieces one inch by three should be used for the sash supports, and should be let into the side boards even with the top and at such distance apart that the edges of two sash will rest on one support. Nail a strip of board on the outside of the lower side of the bed, letting it extend an inch or more above the top of the bed, which will hold the sash squarely in place and prevent their slipping down.

A cheaper box and one much in use in large operations, is made by simply using four corner posts same height as the side boards. When filling, one side is tilted, letting the posts rest on bricks or blocks to give sufficient slant to carry off the water when the sash are placed on. This latter method is, of course, somewhat cheaper, but is also far less satisfactory. Should the above size be too expensive, use less sash; one sash is better than none.

Cold frames are made the same way, simply using soil on the inside and packing or banking with manure on the outside. For winter or early spring use, straw mats or closely fitting board covers should be used on both hotbeds and cold frames when there is danger of severe freezing.

Cloth Covers. A very cheap and also satisfactory covering may be made of cloth instead of glass, and while not entirely dependable for winter work in northern localities, will meet every requirement in many parts of the South. The boxes or beds are made in the ordinary way, but no glass being used the expensive sash are not required. The corners are halved together and nailed with wire lath or shingle nails and clinched. For the center brace or support take a piece same width as the sides and long enough to fit snugly between the side pieces, place in the center and toe-nail the ends to the side pieces. The frames are covered with medium or heavyweight sheeting stretched tightly over frame and tacked to outside edges. After this is done paint the cloth with two or three coats of the following mixture: Two thoroughly beaten eggs to a pint of raw linseed oil. When painting keep the mixture well stirred, and allow one coat to dry before applying another. Three, or even four coats of the paint are better than less, and frames thus covered will stand almost any amount of rain, and the transmission of heat will be found ample for ordinary weather. These frames being very light, should be fastened to the bed, by means of screw-eye and hook at each end. They can, of course, be made any length, to fit any width of bed, but should be three feet in width, as yard-wide sheeting will stretch sufficiently to lap over the edges of the frame. These frames will repay many times over their cost if used for no other purpose than hardening off plants; and for growing lettuce and cabbage plants they are far and away superior to glass, as the heat is less fierce. Some writers on the subject are prone to belittle the usefulness of the cloth-covered sash, evidently forgetting that many cannot afford the outlay necessary for the glass, to say nothing of the greenhouse. Could we all afford greenhouses there would be little need for hotbeds of any kind; since we cannot all afford the greenhouse, nor yet the glass-filled sash, it is fortunate that the cloth covers are available, and ordinarily, will take the place of the glass very nicely. The hot-beds should, if possible, face the south, and be sheltered on the north and west by buildings or other protection.

WHERE TO LOCATE THEM.

For location we want a warm all-day sun exposure, sheltered on the north and west. So if possible, select the south side of buildings or tight, high board fence. The west must also have like protection; for hot beds are a poor investment, or at least, are never at their best

except under ideal conditions. "Labor much, expect much," is the only gateway out to success in gardening. Locate the beds with length east and west, with slope of sash to the south, so that to have the full benefit of the sun.

FILLING THE BED.

The manure (preferably horse,) should be mixed with about its own bulk of straw or forest leaves, well shaken up and stored under cover to prevent leaching. Occasional forking over will prevent heating, which is to be avoided, and also mixes the whole body evenly, which is essential for best results.

A few days before filling the bed, pile the manure up, and tramp it well together, to induce heating, which may be told by the escaping steam. If the weather is cold, covering the heap with straw or corn-stalks will hasten the heating process. Do not let it burn or firefang, but when it is well warmed through, fill it into the bed and tramp it solid. Put on the sash or covers and let it remain until the heat is well started again. Now pitch it over and tramp it well down, giving it the same slope on top as the sash. Cover up and let it remain until the heat is well up, then put on four to five inches of good garden soil. It will require no further care until ready for sowing, except to raise the sash occasionally to allow the rank heat to pass off. It is all the better to remain thus for several days, as it minimizes the danger of burning by the first rank heat. Then, too, many wild seeds will have time to germinate which will be destroyed by raking over the bed previous to sowing. Wet the bed well and rake thoroughly before sowing. With these precautions, there will be little danger of over-heat on the start, and if well aired on sunny days good results are pretty sure to follow.

HOW DEEP TO FILL.

I am well aware that many successful growers use only the ordinary 12-inch box. No excavating is done, and no slope is provided other than is obtained by tilting one side of the box. With four inches space between glass and soil which we must have, this allows but eight inches for soil and manure on the lower side with ten to twelve inches on the higher side. I do not like the practice as there is not a sufficient body of manure to insure bottom heat for long service. I prefer 12 inches of manure to any less, and never complain if I have more, for then I am sure of plenty of heat as long as required. Allow four inches for the plants, four, and better five, inches for the soil, then excavate sufficiently for a good body of manure and you will not regret the extra labor. Before filling, the beds must be banked outside with manure, well tramped down from the ground clear to the top.

WHEN TO START THE BEDS.

If it is desired to grow lettuce and radishes for very early use, start the beds any time in late January or early February. This of course, means plenty of manure outside and in, with sufficient covering for the sash. Early celery and onion seed should go in from February 15th to March 1st. Early cabbage and lettuce for transplanting to open ground will stand pretty cool weather and some frost if well

hardened off before going out. They will require five to six weeks in the hotbed and cold frame. Tomatoes will require seven to eight weeks. Egg and pepper plants grow slowly at first and are also very tender. They will require eight to ten weeks, and ought not to be got out until the ground and weather are thoroughly warm.

There are no hard and fast rules applicable to transplanting to the open ground. In general, very little is gained by planting out until weather conditions are such that the plants will push ahead without check. However, I very much like to get the vegetables as early as possible, and while not advising others to do likewise, I sometimes take long chances. At one time, I planted sweet corn and potatoes on April 22. I was advised by some of my neighbors not to do it. But I figured that if Jack Frost kept his distance I would "get there" ahead of my neighbors. If he did upset my plans then I would not be out very much. I pulled through without getting scorched, and the sweet corn and potatoes were in good demand at my own prices. There is always the element of uncertainty as to the planting time, and spite of all we sometimes get left. There is, however, an average date for every locality when it is ordinarily safe to trust the weather and plant the crops. There is also a basis of reckoning which, though not entirely dependable, is often quite helpful. For instance, we would say that in the locality of Detroit it was usually safe to plant corn from May 5 to 15, and to transplant tomatoes from the latter date on. Then the time for other localities would vary from six to eight days earlier or later for every degree of latitude south or north from that location. This is a generally, though not entirely safe rule.

MANAGEMENT OF THE HOT BEDS.

Very few explicit directions can be given upon this subject as, for small gardens, so many different varieties have to occupy the same hot bed. In general it may be said, however, that there will be very little danger of too much heat at first, provided the directions for filling have been carefully studied and followed. After that, the heat must be controlled by frequently airing the bed. This should be done on all sunshiny days, and the amount of airing will, of course, depend entirely upon the heat of the bed and the outside temperature. In bright sunshine it will rarely be too cold to ventilate to some extent, and it is easily done by raising the covers more or less as necessity demands. The covers or sash should always be opened on the side opposite to the wind.

MOISTURE.

The bed should be well moistened before sowing the seed, so it will not require further wetting until the plants are up. Sufficient water to keep up the moisture supply must be given and the soil should be stirred to prevent crusting. Experience and observation are our safest guides, and by them we may learn more than volumes of theory could teach us.

CHAPTER III.

ALL SEASON'S GARDEN.

A study of the diagram on page 14 will give in brief a plan for the farm, suburban or village garden, that with modifications as circumstances may require, will furnish a varied and abundant supply of vegetables the whole year around. With the diagram and seed catalogues before you, select as noted, or vary as desired, the seeds for one-fourth acre. Have the hotbeds as previously described, started in good time, and cold frames ready for use. Do not get alarmed at the heavy task assigned, as a record of labor in a three-fourths acre garden showed but a few days of time outside the marketing. In this arrangement three-fourths of the ground can be cultivated by horsepower if desired. Numerous varieties are named, but are given with the view of keeping up a constant supply from spring until winter when, with a few feet of cellar space or a cheaply constructed shed, the supply of forced vegetables can go on uninterruptedly until they are again grown in the open ground. A few days' labor with a little careful thought will make it by far the most valuable quarter acre on the farm, and the suburban or village home with less ground will find it proportionately profitable.

The diagram as shown represents the entire garden occupied by first plantings, both permanent beds, and crops to be followed by successions. Then referring to germination and maturity tables, it will be in no way difficult to keep the successions so that very little ground will go to waste. Tomatoes, early cabbage, lettuce, egg plant and pepper should be started in the hotbed. The seed list and diagram are very comprehensive, and may at first stagger some of our good readers, but when the permanent beds, as asparagus, rhubarb, etc., are fully established, fresh vegetables will be at hand 365 days in the year. It will require time to grow the rhubarb and asparagus to forcing age, but the chicory, celery, sea kale, etc., can be forced the first winter. Now as the pickling and canning season is well provided for, it will pay to study the scheme well before casting it aside. However, it can be simplified at pleasure by eliminating undesirable sorts, but, of course, at the expense of a continuous supply and variety.

LIST OF SEEDS AND PLANTS.

Asparagus roots, Palmetto or Argentine.....	25
Asparagus seed.....	2 ounces
Pole Lima beans.....	$\frac{1}{2}$ pint
Bush Limas.....	$\frac{1}{2}$ pint
Kidney beans.....	1 pint
Green pod beans.....	1 quart
Golden wax beans.....	1 quart
Cabbage, early and late, each.....	1 packet
Cauliflower.....	1 packet

Carrot, early and late, each.....	1 ounce
Celery.....	2 packets
Celeriac.....	1 packet
Cucumbers, early and late, each.....	1 packet
Corn, early.....	1 pint
Corn medium.....	1 pint
Corn, late.....	1 quart
Endive.....	1 ounce
Eggplant.....	1 ounce
Kohlrabi.....	1 ounce
Lettuce.....	2 packets
Muskmelon.....	1 packet
Watermelon.....	1 packet
Prizetaker onion.....	$\frac{1}{4}$ pound
Onion sets.....	1 quart
Pickling onion seed.....	1 ounce
Beets, early and late, each.....	2 ounces
Cress.....	1 ounce
Chicory.....	1 ounce
Dill.....	1 packet
Lavender.....	1 packet
Sage.....	1 packet
Sea Kale.....	1 ounce
Parsley.....	1 ounce
Parsnip.....	$\frac{1}{4}$ pound
Pepper.....	1 packet
Peas, extra early, medium, late, each.....	2 quarts
Radish.....	1 ounce
Radish, Winter.....	1 ounce
Rhubarb roots.....	25
Spinach.....	$\frac{1}{4}$ pound
Salsify.....	2 ounces
Mustard.....	2 ounces
Squash, early.....	1 ounce
Squash, Winter.....	1 ounce
Tomatoes, early and late, each.....	1 packet
Turnip.....	2 ounces
Potatoes.....	$\frac{1}{4}$ to $\frac{1}{2}$ bushel
Strawberry plants.....	125
Raspberry plants, red.....	75
Black raspberry plants.....	50
Pie Pumpkin.....	1 ounce

PERIOD OF GERMINATION.

There are no ironclad rules as to the exact time required for the germination of seeds as so many conditions enter into the problem. Some general calculations, however, may be made and are helpful in the planning and management of the garden. The following table shows the average time of germination from planting, of the more common seeds:

	Days.		Days.
Beans.....	5 to 10	Lettuce.....	6 to 8
Beets.....	7 to 10	Onions.....	7 to 10
Cabbage.....	5 to 10	Parsnips.....	10 to 20
Carrot.....	12 to 20	Peas.....	6 to 10
Cauliflower.....	5 to 10	Pepper.....	10 to 14
Celery.....	10 to 20	Radish.....	3 to 6
Corn.....	5 to 8	Salsify.....	7 to 12
Cucumber.....	6 to 10	Tomato.....	6 to 12
Endive.....	5 to 10	Turnip.....	4 to 8

This table presupposes ordinarily fair conditions, and will vary considerably under the extremes of very poor to ideal surroundings. The same is also true as to the average time of maturing. For illustration, an early variety of sweet corn planted under just the right conditions might mature in 65 days. The same variety planted a month earlier with ground and weather barely warm enough to sustain life might require 70 to 80 days. This means that many of the so-called extra early varieties are not such under all conditions. The results of one season may be entirely overturned by the varied conditions of the following season; and thus our air castles get moved from their foundations.

The table below will be helpful in laying out the garden and planting, so that the crops of like periods of growth may be planted together, if desired, and thus make the succession of crops more convenient.

MATURITY TABLE.

	Days.		Days.
Beets.....	40 to 60	Egg Plant.....	150 to 175
Cabbage.....	90 to 115	Muskmelon.....	125 to 150
Carrot.....	90 to 110	Onions.....	130 to 150
Celery.....	150 to 160	Parsnips.....	90 to 120
Corn (sweet)	65 to 80	Peas.....	40 to 75
Cucumber.....	55 to 75	Peppers.....	140 to 160
Lettuce.....	65 to 75	Radish.....	20 to 30
Watermelon.....	125 to 150	Spinach.....	60 to 80
Squash (winter).....	120 to 150	Squash (summer).....	90 to 100
Tomatoes.....	110 to 120	Turnips.....	60 to 75

The above table of course, refers generally, to the time from planting to time of full maturity, but is subject to much change in actual work.

Garden Tools. It will pay many times to invest in a few good tools, and a list of the much needed ones will show what each reader lacks, so that they may be supplied and be ready for use. Hoe, garden rake, fork (four tine), shovel, spade, wheelbarrow, garden line, dibber, seed drill, double wheel hoe with attachments and weeder. Any smooth stick 12 or 15 inches in length, nicely rounded at one end to prevent bruising the hand, and well sharpened at the other, will make a good dibber. An old spade or shovel handle sawed the same length will be far better. A carpenter's chalk line (heavy) or tarred matting twine with two small stakes will make this outfit complete.

Many of the seedsmen advertise a very cheap and convenient hand-drill costing about \$1.25. If a more expensive one cannot be afforded, these will be found very satisfactory. Drilling seed by hand is slow and tedious work, and some sort of a drill should be at hand. There are many very excellent wheel hoes manufactured, all, so far as I know, do good work, only do not bother with a single wheel. The double hoe costs but little more and in actual practice is worth many times more. Personally, I use the Planet Jr., with plow, rake, cultivator and hoe attachments, also a weeder of my own make. With these attachments, I have never seen any tool capable of so many kinds of work, and for a garden of these dimensions, I would give very little for the use of a horse after the ground is once fitted. The weeder is simply a strip of board one inch by four, and three feet long.

Draw a line three-quarters of an inch in from each edge, and drive a row of spikes (40-penny wire,) along one line four inches apart. Drive the spikes along the other line so that they will stand midway between the spikes of the first line. In the single line they stand four inches apart, but by the double line they run only two inches distant. Bolt this either squarely, or at an angle to the under side of the wheel hoe and you have a weeder that is death to the weeds, and a sure preventive of damage from ordinary drought. It is too wide to push easily as we work the other attachments, but works easily when pulled. It may be weighted or not as desired, and may be used to run over the surface either before or after the plants are up. If worked in time and often enough, very little hand weeding is necessary in any kind of vegetables, and this saving of labor is a great item. Use it from before the seeds are sown until the size of plants prevents further use.

Plant Protectors. An indispensable adjunct to growing first early vegetables is a supply of plant protectors. Heavy tarred building paper, everything considered, is the most desirable material. It is sold here at seventy-five cents per roll, and the protectors can be made, labor included, for from one and one-half to three cents apiece. Cut the material lengthwise or crosswise of the breadth, as will cause least waste, any length or diameter desired. Bend the strips round with one-inch lap; with a sharp knife make an incision through both ends and fasten with brass paper fastenings. Covers of the same material are made by cutting into squares a little larger than the diameter of the protector. They are very useful in windy weather to prevent the plants from whipping, and plants thus protected in cold and stormy weather may with safety be set ten days or two weeks earlier than otherwise. When desired for use, the covers may be held in place by slightly weighting with earth. They will many times repay their cost each year, and low ones (say four or five inches high,) left permanently around the Hubbard squash hills are almost a guarantee against the black squash bugs.

Fitting the Ground. In a general way, we talked in chapter one of various soil textures and their management. But the particular method of fitting any soil, ready for the seed, was purposely left until now, for convenience of the reader, and that fitting the soil and planting might follow each other in their regular order.

If heavy clay soil, turn under deeply as much coarse manure as possible. This in general will be good treatment for all soils for the first year, but especially for heavy clay, or clay loam, only do not forget a generous top-dressing of fine manure. Air-slaked lime, 500 to 750 pounds to the quarter acre, will prove very valuable in correcting soil acidity, which is far too often the condition. It will loosen the hard soils, and bind the thin light sands, and in either case it will not be amiss. Ashes, leached or unleached will do the same work, so if possible to obtain, use the lime or ashes, as a top-dressing on the furrows, and work thoroughly into the soil. Plow the ground as early as possible, but if heavy soil, not until the soil at the bottom of furrow will crumble to some extent when worked in the hand (not like putty,) else it will bake. Lighter soils can be plowed if quite wet, but let it be done as early as possible; then use the harrow at every opportunity until planting time. Plow lengthwise, by back furrowing from the center, thus avoiding dead furrows. After lime or ashes have been thoroughly worked in, then spread on the fine manure and harrow again, and when pretty sure that you have it well fitted, then keep right on fitting until ready to plant.



All Season's Garden 66 x 165 feet.

Strawberry 55	Rhubarb 30	R. Raspberry 40	B. Raspberry 20	Asparagus Roots 20	48	
	Asparagus Seed 50	Dill 20	Lavender 15	Sage 15	Parsley 15	24
Parsnips 45	Salsify 45	Swiss Chard 15	Chicory 10	Early Carrots 25	Early Beets 25	18
Prizetaker onion seed 60	Pickling onion 25	Bunching onion 25	Spinach 30	Mustard 15	Cress 10	12
Bush Summer Squash 4x50	Early Cucumber 4x50		Early Turnip 20	Lettuce 25	Radish 20	12
	3 Rows Late Peas 65		3 Rows Medium Peas 55			24
3 Rows Late Peas 65		3 Rows Medium Peas 55			36	
Pole Lima Beans 65	Bush Lima Beans 45	Stringless Green Pod 30	Wax Beans 25		36	
3 Rows Early Potatoes followed by Celery and Celeriac					36	
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Note { Figures following the names of varieties indicate length of drill in feet. Figures at top of diagram indicate distance between rows, in inches.

CHAPTER IV.

PLANTING THE GARDEN.

The directions for planting the all-season's garden presuppose that the hotbeds are already in operation, and that the ground has been well manured and thoroughly fitted. I fear, however, that fitting has been slighted. If heavy clay soil and lumpy, those lumps ought in some way to be ground to powder. You can do this with the pulverizer, disk harrow or roller, but lacking these, make a float. Take three two-inch plank, 1x6 feet; in one plank bore a half-inch hole one foot from each end, and two inches in from one edge for chain and clevises. Use this for the front plank, and lap the second plank two inches on to the back edge of the first one, and bolt or spike on firmly. Lap the third on to the second in same way as the first, like the clapboards on a house. Load with stone, bags of sand, or get on and ride. It will pulverize the lumps and be equally useful for firming light sandy soil, which is quite as important. After this the permanent beds are in order.

ASPARAGUS.

A few square feet of space with intensive culture, when in full bearing, will supply a family of several; so do not be cheated out of the bed for seeming lack of space. Lay out the ground at distances which best suit personal requirements and plow or spade out trenches from six to ten inches in depth. Wherever the plants are set, a slight mound of earth should be left in bottom of trench. Naturally the roots grow in the form of an umbrella, and when setting out the plants the crowns should rest in centre of mound with the rootlets spreading out naturally around the mound. Cover with fine soil and firm sufficiently to hold the roots securely in place and the balance of filling in may be done with plow or any convenient way to do it rapidly. The same general directions will apply at whatever distance the plants are set, but if the space is narrowed down to a small bed, it is usually best to excavate the entire bed, and after setting the plants in position, fill in the soil the same as was done in the trenches. Do not set old plants. One year old, while a little longer in coming into full bearing, will give best results in the end.

Remember that the asparagus beds properly set and cared for, should last fifteen to twenty years, so the most careful preparation at the beginning will amply pay in the end. Do not expose the roots to the sun or drying wind before, or at time of setting. Set in freshly made trenches and be sure the soil is well moistened. Keep the ground clean by frequent cultivation and apply a liberal top dressing of stable manure. No cutting should be done next year, but the year following considerable may be obtained, and the bed should be in full bearing the succeeding year. For forcing purposes sow the seed one inch deep in the drill and follow cultural directions as above. When the plants are up and well established, thin to one foot apart. With intensive culture and fertilizing, the roots should be ready for forcing

two years from the following winter, but would, of course, be better the third season. The same general directions as for forcing rhubarb will also hold good for asparagus. Sowing should be made each year to keep up a root supply.

HERBS.

Sage and lavender are, of course, perennial, i. e., they live from year to year, and are grown for the leaves. Sage is used medicinally and for seasoning; lavender is principally grown for the distilled water in a commercial way, but for home use the dried flowers are used in the linen chests or drawers. The sage leaves and tender stalks should be cut just as the blooming season begins, and quickly dried in the shade. Sow seed early and keep clean of weeds. The lavender will require some thinning, but the sage should be thinned to sixteen inches in the row. It is well to divide the old sage roots in spring. Dill requires the same general treatment, but need not be thinned much, and the stalks should be cut before ripe enough to shell, and tied in small bundles to cure. Parsley should go into the permanent beds. The seeds are sown the same as others, but being very slow to germinate, should be sown as early as possible. When plants are well up thin to twelve or fourteen inches in the row, and when three inches high shear off the tops, which gives a new and stronger growth. Whenever the tops turn brown or discolored, shear off, and the next growth will be better. Any other herbs may be substituted for, or added to, this list if desired. The same general rules of culture apply to all, only remembering that rich soil and good culture are passports to success.

RHUBARB.

Doubtless most of our readers have this vegetable growing in their gardens and are now enjoying the many wholesome and delicious dishes prepared from it. Many, however, are not aware that the most beautiful crop of it can be grown in the dark, and during the coldest weather of winter. It is so easily grown that every family may have a daily supply from January to May, at almost no cost. Do not allow the seed stalks to grow at any time, but break them out as soon as they appear. When the leaf stalks begin to grow tough and stringy, begin to cultivate the plants and work a liberal supply of manure into the soil close around them. Do not break off the old leaf stalks, but allow them to wither away at will; but keep the weeds and grass out and work thoroughly and manure liberally until late in the fall.

By dark forcing we mean growing the rhubarb in the dark. It is grown in the house or root cellar, or cellars constructed purposely for the work. The forcing cellar can be made very cheaply; the only requirements being that it must keep out the frost and light. It requires some artificial heat, forty-five or fifty degrees at least, but it may be heated to eighty-five or ninety degrees and do no harm. The heat may be furnished very cheaply by means of a stove, or sometimes kerosene lamps are used. The roots must be strong and vigorous, two or three years old and upward. They are dug out of the ground and allowed to freeze solidly before putting them into the cel-

lar. They are taken up with as much soil adhering to their roots as possible, and are set snugly together on the cellar bottom. The spaces between the roots are filled in with loose soil. As soon as the roots are thawed out, the stalks begin to grow, and the rhubarb is ready for picking in three to four weeks—if the heat has been kept up to seventy degrees or higher. The lower temperature usually gives a larger yield, but of course requires more time. The ordinary kinds such as we grow out of doors are used for forcing. Any of the varieties will answer, but *Victoria* and *Linnaeus* are best. It is grown from December 15 or a little later until April, and is very profitable. As all the work is done during the winter months it bridges over a period of inactivity and brings cash returns at a time of year when most needed.

RASPBERRIES.

Nothing but the very best both as to varieties and vigor is good enough, and they should be had at whatever cost. Set them out carefully do not throw or stick them into the ground. Begin cultivating as soon as set out, and never allow them to check in growth, for want of good care or liberal fertilizing. When two to 2½ feet high pinch back the tops to allow lateral shoots to develop. Light catch crops may be planted in the rows the first season, as beans or some small-growing variety of corn. Do not be satisfied with half-hearted work or poor stock, as results will be disappointing.

STRAWBERRIES.

For the strawberry bed I would select the varieties as to season, early, medium and late, with medium predominating as to number of plants for convenience in canning. Get the best plants that money can buy; I mean get the best varieties, and those bred up by specialists in that line; you will have fewer runners to fight and get larger crops of better berries. If the plants are thoroughbred and the ground is rich as it should be, set the plants 30 inches apart by 18 inches in the row, and allow no runners to grow at any time. This, of course, leaves them in hills so that thorough culture can be given at all times. If set 36 inches apart by 20 inches in the row, they can be allowed to set runners to some extent in the rows. Either way will doubtless give better results than growing in matted rows. When setting the plants, do not allow the sun to shine on the roots at all. Moisten the roots well (do not soak them), a few at a time, and leave a small mound of earth in the row where the plant is to be set. With the crown resting fairly on the mound, allow the roots to fall and spread naturally over the mound, and cover with fine earth at once. Cultivate immediately after setting, as the ground will be more or less tramped down, and much moisture will be lost, which cultivating would save. This will be found excellent practice in all the garden work, cultivate and cultivate. Set the plants in freshly worked soil, and *set* them, do not stick them. With the best of plants properly set and properly cared for you will grow three to four good crops without renewing.

BEANS.

The wax and stringless green pod varieties, for best results, should be drilled or dropped four to six inches in the row; they are very tender, and should not be planted until all reasonable danger from frost is passed; but after that they may be planted at intervals of two weeks or a little more, for succession. As soon as the plants are well out of the ground apply the nitrate of soda, same as for early cabbage. It should be applied every few days, especially if there are any traces of rust. The same treatment as to nitrate of soda (or saltpeter if more convenient) should be followed with the Lima beans. These, both bush and pole varieties, especially in the North, should be started in pans or boxes of soil, either in the hotbeds or sunny windows. They may be started two to three weeks earlier than they could, with safety, be planted in the open ground. Plant one inch deep, making sure that the eye is down, one in a place, and far enough apart that they may readily be taken up without disturbing the roots. In taking up, be sure that the soil is sufficiently moist to adhere well to them. It is best to take plenty of soil with the plants and set in holes previously dug. With care in handling, the plants may be reset with entire safety, and the season of maturity very much hastened. The bush Limas should be set two feet apart in the rows, as with good soil and culture they will spread a good deal. If the pole varieties are to be trained to a single pole, they should be set previous to transplanting the beans. Set three or four plants around each pole on a slightly raised mound of earth. Poles seven feet above the ground are sufficiently high, and when the vines reach the top they should be tied there and pinched back. The trellis is very desirable, but I have very little faith in corn or sunflowers planted in to take the place of poles or trellis. When poles are used, the vines must be trained and tied occasionally to the poles, and the most convenient way is to wind the string or cord used for tying, around the left wrist. This allows free use of both hands for the work, and saves much trouble by avoiding tangling the cord. Carefully avoid working among the vines in any way while they are wet. The pole varieties should be set at least three feet between rows, but two feet in the rows will answer for the garden.

CABBAGE.

If the early cabbage was started in the hotbed, the plants should be picked out and set farther apart, so as not to crowd too closely. This should be done as soon as the plants begin to crowd in the row. They will, of course, have to be hardened off in the cold frames or given all the open growth possible in the hotbed. Nitrate of soda, an ounce to the gallon of water, sprayed or sprinkled upon the plants occasionally will be of great benefit. They can be removed to the open ground quite early, as they will stand frost to some extent. When the leaves are two inches in width clip them off and the plants will grow all the more stocky and strong. Clipping back at the time of transplanting, will materially aid the plants. The late cabbage and cauliflower seed should be sown thirty-five to forty days previous to the time of transplanting, which in this locality would be late in June or early in July.

The culture is the same for both, except that when the cauliflower heads begin to form they should be sheltered from the hot sun's rays by tying the outer leaves up over the heads. It is well not to transplant too early, as they head better in the cooler days and nights of Autumn. They should be cut for use while the "curd" or head is still firm and solid, and before they begin to divide into branches.

CELERY.

As the seed is very slow to germinate it should be sown quite early in the shallow boxes or thoroughly prepared soil in the seedbed, as indicated in former diagram. The soil should be kept moist, almost wet. Sow in drills, covering very lightly, and keep the soil well stirred and free from weeds. When about two inches high the rows may be thinned by transplanting to three inches apart and when three or four inches high clip back the tops to give more growth to the roots. Transplant to permanent rows from middle of June to the first part of July, and clip back both roots and tops from one-fourth to one-third. If soil blanching is depended upon, the plants should be set not less than four feet apart by six inches in the row. If blanching with boards, thirty inches apart will be sufficient. Nitrate of soda, liquid cow or hen manure will be very beneficial to the crop, and plenty of moisture is also equally essential. Celeriac seed will be sown the same time as celery and the culture will be the same. The root, however, is the edible part, and of course no hilling up or "handling" is done. Roots two inches in diameter are large enough for use, and the winter supply may be packed in sand in the cellar, or may be pitted the same as beets.

CORN.

The chief difficulty with planting sweet corn very early is the danger of rotting before germination takes place. With this difficulty eliminated, many days' time will be gained in maturing the crop. Take shallow pans or a dripping pan (pie tins will answer) and put a half inch of sand in the bottom; spread a thin cloth over this, and sprinkle the corn on thinly. Place another covering of cloth on and cover with more sand; one-fourth inch will be sufficient. Keep it moist and moderately warm by placing it near a stove or in the warming oven. If kept moist and warm, the corn will sprout in a few days, and may be planted even if the weather and soil are still quite cool. Cover shallow, however, that it may get all possible benefit from the sun. The medium and late varieties will not require this treatment, as they need not be planted until danger of cold weather and frost is past.

Planting Sweet Corn. As cultivation in both directions is usually impracticable in small areas, the sweet corn will stand considerable crowding. With good soil hills twenty inches apart in the rows will produce a good crop. The first early varieties are usually small stalks, and will even stand one good plant every six inches. A close and continued succession is always desirable, and having a really good variety of first early, it is often advisable to make a second planting a week to ten days after the first, and especially so if the first planting was sprouted. This will certainly carry the first early well over

to the season of medium sorts. Personal experience has pretty thoroughly weaned me from Early Cory and all its strains, and I have found none more hardy and free from smut than Sheffield Sugar.

EGG PLANT.

This is allied to both the potato and tomato family, but is far less hardy than either. It requires very warm rich soil and under these conditions grows very rapidly. Four weeks previous to setting in the open ground is time enough to sow the seed in hot bed, and June first, is soon enough to plant in open ground in northern localities. Its insect enemy is the potato beetle which must be either hand-picked or poisoned. It is also subject to rot which may be prevented by spraying with Bordeaux mixture. Too early planting will sometimes cause mildew, and the preventive is later setting. The plants should be set about 3x4 feet in the rows.

ENDIVE.

The late sown is highly prized in many localities as a winter salad. The seed may be sown in drills as late as July, and when plants are well established should be thinned to ten or twelve inches in the row. Clean culture is all that is necessary until late fall, or when wanted for use; the outer leaves are drawn up and tied over the center of the plant, when they will blanch nicely in a few days' time. The Green Curled is a hardy and desirable variety, and blanches to a clear white.

EARLY PEAS.

For the first early peas, sow only smooth varieties, and cover one inch deep. They should be sown as soon as the soil will work nicely. For this reason I would discard the wrinkled varieties, as they are liable to rot when sown too early. Do not cover deeply; they will stand lots of cold after they are once up, but any variety will rot if covered too deep while the soil is cold. This for the first early varieties only, culture for medium and late will follow later.

LATER PEAS.

Both medium and late, for best results, should be planted deeply, but not until the soil is warm enough to preclude danger from rotting. The wrinkled varieties will now be in order, and should be used, as the flavor and bearing qualities are much superior to the earlier, smooth sorts. Open the trenches three to four inches deep, with the plows on the wheel hoe, same as for potatoes. Sow the seed thickly, enough to insure a good stand (one quart to the 100 feet of drill is not too much,) and cover not to exceed one inch. When the peas are up, fill in with soil as rapidly as the growth of vines will permit, and when the trenches are fully filled, the roots will have sufficient depth to withstand the hot sun and drought of the advancing season to a much later period than if planted shallow as for very early crops.

EARLY TOMATOES.

With the hotbed and plant protectors, the problem of early tomatoes is solved. Sow early in the hotbed and transplant when the second leaves appear into rows two or three inches apart; they will find room to grow without crowding for some time to come. When

grown sufficiently to begin to crowd transplant into pots. With broken bits of pot placed in the pots for drainage, fill them one-third full of soil; as the plant is placed in the pot add soil enough to hold the plant in place and firm down well around the roots, and fill up with loose soil. Do not pack or firm the soil about the stems. Place the pots in a tub partially filled with water which has been exposed to the sun, and when thoroughly soaked from the bottom upward place in the cold frame. With frequent watering and uncovering on warm days they will make the stem and root growth so essential to early fruiting. When ready for the open ground, dig holes large and deep enough to hold the entire contents of the pots. Soak the pots thoroughly and jar out; if carefully done the roots, now grown through the entire mass, will hold intact. Place in the hole and fill up with loose soil. Set out in this way, the work may be done under the hottest sun, and plants will never wilt or change color. They will receive no check, and with the plant protectors for cold days or cold storms they may be safely transplanted two weeks earlier than they otherwise could.

KOHL RABI.

The seed may be sown up to the middle of June, or even later, in drills, the same as turnips. They will be found a valuable acquisition to the table supply, and any surplus above home or market use, may be fed to stock with good results. They are cooked the same as turnips, and considered by many superior to that vegetable, and as a drought-resister are more hardy.

ONIONS.

The sets for early table onions should be planted two or three inches apart in the rows. If they are in bunches, pick them apart, and the convenient way of planting is to make a hole with the finger, dropping the set in and covering. The Prizetaker requires early sowing and any amount of fertilizer as ashes, hen manure, etc. The same is true for the pickling onions also. The rows should be very straight, and seed should be covered one and one-half inches; cultivation should be begun as soon as possible after sowing. The pickling onions should be left to stand quite thickly in the row to avoid too large size; but the Prizetaker when well established, should be thinned to four inches.

POTATOES.

If you are ambitious to be ahead of your neighbors in early potatoes, and the spring should prove cold and backward, start your potatoes in sand. Use broad shallow boxes not to exceed three inches in depth, with an inch of sand in the bottom. Cut potatoes, two eyes to the piece or more if you desire; put them into a pail or other deep vessel and cover them with a generous sprinkling of sulphur. As you pick the pieces out one by one, the sulphur will rattle down through the mass and pretty thoroughly cover them. Set them eyes up, closely together in the sand, and when the layer is complete sprinkle on sufficient sand nearly to cover them. Moisten well and set in a partially darkened room with a temperature of forty-five or fifty degrees, and leave them to grow until ready for planting. When ready to plant, put the plows on to the wheel hoe, set them closely together

and open the trenches. Drop the seed pieces fifteen inches apart, being very careful not to break off the sprouts in handling. Now reverse the plows with moldboards turning in and set widely apart; run the machine astride the rows, which will throw the soil back into the furrow, and the potatoes will be covered as rapidly as one cares to walk. They will be up in from three days to a week, owing to length of sprouts when planted, and they will stand head and shoulders above those planted in the old way from start to finish. The sulphur is, to some extent, a preventive of scab, and it also preserves the seed pieces much longer, which I think is a decided advantage.

PEPPERS.

These are slow growing plants and should be started in the hotbed equally as early as tomatoes. They are also tender and should not go into the open ground until all danger of freezing is past. Plant in rows two feet apart by eighteen inches in the row, and give thorough cultivation.

PARSNIPS AND SALSIFY.

Parsnips and salsify will require the same culture except that parsnip seed should be covered quite shallow and salsify deeply. Sow during the month of May and thin to three inches. Both are entirely hardy, and may remain in the ground during the winter. The winter supply may be dug in the fall and packed in sand in the cellar, or stored in pits. Chicory requires the same culture as parsnips, but is used only for forcing in winter for the tops. Beets and carrots for the winter supply should be sown according to locality from June 10 to July 1, and in some localities even a little later, and the culture is essentially the same as for parsnips, etc. With all the above root crops avoid the use of green or fresh manure, as it almost invariably causes ill-shaped roots. The half-long carrots and turnip-shaped varieties of beets will be most desirable for table use.

Swiss Chard is very similar to the beet except that the tops alone are the edible portion. The cultivation is the same, but the seed should be sown early in May. The large ribs forming the leafstalk are cooked and served the same as asparagus, and the leaves are used for greens and considered by many superior to all others. They should be thinned to twelve or fifteen inches in the row, and the tops after attaining suitable size are broken out at any time. Late in fall the roots may be taken up for forcing same as rhubarb. The seed bed indicated in diagram will be available for all varieties of plants up to the time for transplanting the late cabbage and cauliflower.

Spinach will be the chief reliance for greens until the early beets are ready for use. The soil must be very rich for best results, and thinning for use may begin when the largest leaves are two inches wide. One or two sowings may be made for succession, but it will not pay to carry it into the hot weather, as it becomes tough and stringy then. For winter and early spring use, sow according to locality, from September 1 to 30. When cold weather comes it should be covered with coarse litter to hold the snow. Early radishes will,

under favorable circumstances, mature very quickly, and frequent sowings should be made, as when overgrown they become worthless. They are very easy of culture and are always welcome in the early season. The winter varieties should be sown early in the summer, and may be used during the fall. The winter supply may be stored in sand or pitted the same as potatoes.

SALADS.

Nearly all the salads require essentially the same cultivation and should be sown as early as the conditions of soil and weather will permit. As the diagram on page 14 shows everything in drills or rows it is taken for granted that these terms are understood all the time, and nothing is mentioned of broadcasting. Lettuce should not be covered to exceed half an inch, and the plants may be picked out for transplanting at any time after they are well established. As soon as large enough the plants may also be used for salad, but when thinning out either for transplanting or salad, leave good vigorous plants standing four inches apart in the rows. Later on, as they begin to crowd in the rows, every alternate plant may be taken out and the others left to head up. Liquid cow manure will hasten the heading and increase the size of plants. The summer and fall supply of lettuce is usually cut short by the persistent habit of the early sown, of running up to seed, so that the table is usually minus this delicacy quite early in the season. Select a moist and somewhat shaded spot, work the soil fine and mellow and make very rich with well rotted stable manure, or better still, soak the soil thoroughly with liquid cow manure. After two or three days rake well and sow the seed, not too thickly, and cover lightly. As the plants begin to grow, thin out for use, or transplanting, and the remaining ones as they get more room, will begin to head up nicely, and with plenty of water and good culture will give a supply indefinitely. Any surplus above home or market use will be profitable for poultry, especially if kept in confinement.

Mustard is a very healthful and desirable salad, but the seed should be handled with great care, and not allowed to be scattered outside the drill. Sow early and for succession make sowings every ten days or two weeks. In about twenty-five days from sowing the plants should be large enough to use for salads, and the rows may be thinned out as required for use, leaving the plants two or three inches apart to grow for greens. When it begins to blossom, cut it out and never allow a plant to set or mature its seed. Turnips when sown for early use may well be included in the list of salads. They can remain standing quite thickly in the rows until the tops have made considerable growth, when they make delicious greens. Thin to three or four inches in the row, and in hoeing invariably hoe the soil away from, and not to the turnips. They will make far more rapid growth, and will be less liable to attack from the worms. Cress (upland) should be sown as early as possible, and make continual sowings as long as desired. For early winter use sow early in the autumn, but in any case the ground must be very rich and mellow for the best results. Dust the plants with *Pyrethrum* to guard against insects.

VINE CROPS.

Sow the early cucumber seed in the small plant or berry boxes, as nearly as may be, about four weeks before they could be safely transplanted to the open ground; not too early, as they should not become overgrown before transplanting, and they should not go into the open ground until all ordinary danger of frost is past. When transplanting, great care in handling is necessary, as disturbing the roots will seriously check, if not altogether ruin the plants. My own method is to plant the seeds in the small berry baskets and place them in the hotbed. If from any cause there is delay in planting out, so that the roots begin to penetrate the hotbed soil and grow fast, I place the baskets on boards. When ready to transplant, soak the boxes thoroughly and remove the bottoms with a sharp knife, and plant box and all right in the ground at least an inch below the surface. Carefully draw in fine soil about the plants until the surface is level, and if well done the plants will receive no check. The plants should, of course, be hardened off in the cold frames before going into the open ground. Follow the same plan with the muskmelons and watermelons. The late cucumbers, squash and pumpkins will do well enough planted in the open ground. The hills for all the vine crops should be bountifully supplied with well rotted manure thoroughly worked into the soil. Allowing about 105 to 130 days for the late squashes to mature, it is well to delay the planting as late as possible, as there will be less danger from the ravages of the bugs. When sufficient fruits have set, it is well to clip back the vines and keep them so pruned to considerable extent. The seeds of the small early pie pumpkins may be put in the hills of early corn after that is well started. They will not interfere to any extent with cultivation, and will make rapid growth after the corn is out of the way. Clipping back the vines will also give a better crop of pumpkins. Select long-keeping varieties, as many of them will, if properly stored, keep perfectly until February or March. For late cucumbers, a safe rule is to plant when blackberries are in bloom and a liberal supply of seed is at least a safeguard against the bugs. It helps to satisfy their appetites, and the surplus vines can be pulled out when desired. The best preventives of the ravages of the Striped squash beetle and Black squash-bug are very rich soil and good culture, and the best remedies are cayenne pepper, tobacco dust, air-slacked lime, ashes and Bordeaux Mixture. These in the order named and applied while the dew is on. Use tobacco dust very sparingly if at all on watermelon vines; it may be used more plentifully on all other vines. Hunting and killing the Black squashbug is the best preventive or remedy against its ravages.

TRANSPLANTING.

The all-seasons garden is planned and detailed with the distinct thought or fact in view that crops well planted are more than half grown. Well planted not only means that the ground should undergo the most thorough preparation, but that the seed should have every possible advantage in its favor; planted not too deep, neither too shallow, not too early and by all means not too late. In the main, it has been designated what seeds should be planted early and what

late; what should be planted deeply and what shallow, so that by careful study of the directions many otherwise serious mistakes may be avoided. Usually there is no part of the work more recklessly done than the transplanting. In the matter of cabbage and cauliflower, it is no uncommon sight to see the transplanted plants sweltering under a hot July sun with all their load of broad leaves trailing in the dust, only to tax the already overburdened plant for a few days of grace, and finally wither up and fall off. Why not avoid all this useless waste of vitality by clipping back the large leaves at the time of transplanting? The same is also true of tomato plants. Cut back and give the roots at least a fair show for their life; the shock is severe enough with every possible condition in their favor. They may be planted very deeply, in fact, should be, especially if tall and inclined to grow spindling. It is my practice to clip back all lateral shoots, and set nearly or quite down to the lower branches. Pepper and egg plants, as also vines of running habit, will not, of course, stand this treatment, but disturbing the roots of such plants must be avoided, and I do not like the plan of pulling up any kind of plants. Take them up with a knife, trowel or spade, and the vine plants that are to be transplanted should be started in plant or berry boxes, that may be planted right into the soil without disturbing the roots in any manner whatever.

CULTURE.

The wheel hoe with attachments and the weeder previously described will fully solve the problem of garden culture. It is well to start the weeder on all the crops grown from seed very soon after sowing or planting. Do not wait until the plants are up, else the weeds will be there ahead of you. It is entirely safe to run it over nearly everything right from the start, only it must not run too deeply over seeds covered shallow. Start early and keep at it, and very much hand weeding will be avoided. As soon as the potatoes begin to break through the ground, take the wheel hoe with the plows set apart, and mold boards turning in, and run it astride the row, entirely covering the plants. They will soon break through the till again but the weeds will be buried. The corn is handled in the same way, only do not cover it, but throw the soil right into the soil. After going astride the rows as above, take off the plows and set the hoes closely together, and work between the rows, which will keep the surface entirely level, except directly in the hills, and weeds cannot live where the hoes are properly used. With all other vegetables, set the hoes apart sufficiently just to allow the plants to pass between them without cutting, go astride the row, and afterwards, if rows are so far apart that all the surface between has not been worked, set the hoes closely together and work between the rows. This is why I previously advised never bothering with the single wheel. With this method of culture very little hand weeding is necessary; but of course thinning must be done by pulling out or cutting out with a narrow sharp hoe.

Vigorous Growth. The table qualities of all vegetables depend very largely upon vigorous growth. No vegetable grown under un-

favorable conditions will ever reach anything like perfection. So then, for best results conditions should be as nearly right as possible. These conditions, in so far as man is able to control, are good seed, thoroughly prepared seed bed, careful planting and diligent cultivation. With man's part properly attended to, Nature will usually answer for the rest.



CHAPTER V.

POSSIBILITIES OF THE SMALL GARDEN.

It is often very difficult for the owners or occupants of small grounds to see that anything in the way of flower or vegetable growing can be accomplished, and chiefly for the reason that their grounds are small. Hence it is that the back yards of so many suburban and village homes are merely grass plots, or worse still, only weed and rubbish patches. If these idle yards and vacant spaces were only devoted to the useful and beautiful, if the boys and girls were encouraged and carefully taught how to make them so, the parents would be spared many heartaches. Heartaches over the waywardness or vicious habits of their children who are simply starving for something to do.

Now what can be done with the small yard? One instance of what has been done may perhaps solve the problem for many others. A few years ago our home was a six-room cottage on a lot 32x105 feet with shed 16x20 feet occupying the rear end of the lot. The entire space between the house and shed was 32x45 feet, with a brick walk 2½ feet extending the whole length, and a grass plot 14x20 feet, which must be deducted. Exclusive of potatoes and sweet corn, that space, what little there was, furnished the entire vegetable supply for a family of three adults and considerable company as well, for the entire Summer, besides much given away and considerable more put up for Winter. Did we eat anything? Well, the male gardener always managed to tip the beam at over 200 pounds, while the female florist never went hungry longer than to prepare a meal, and as to visitors, they ate and returned and "further, deponent sayeth not."

WHAT WAS GROWN.

In vegetables, we had onions, radishes and lettuce to eat and give away; beets and cabbage, peas, two varieties, both to eat and cheer our neighbors with; Lima beans, a plentiful supply for use while green, and some to store for Winter; sage and parsley in abundance; Fordhook squashes, and tomatoes for the Summer, and the entire Winter supply for canning. Upon taking possession of the place, we found already growing one large clump of lilacs, one two-year-old peach tree, six currant bushes just coming into bearing, and a strawberry patch from which 12 quarts of berries were picked. In vines, we had cinnamon, wild cucumber and morning glories in profusion; in flowers (perennials) were ferns and wild flowers, sweet william, larkspur and hollyhocks; in annuals, phlox, petunias, salvia, mignonette, asters, balsams, nasturtiums, pansies, ageratum, sweet peas, candytuft and pinks.

The shed, with runway on the common, was used for the hens, from which came the egg supply, and two sittings sold at \$2 per sitting, and 13 finely-bred chicks. This may seem a fairy tale, but it was actual experience, and not theories figured out on paper as possibilities. Much of the work was done in a hap-hazard sort of way, with hardly a thought as to what might be accomplished. Much more

might have been done, with careful attention to rotation, the help of a hotbed, and the idea of keeping every foot of ground constantly occupied and at work. The results are given not boastingly, but simply to encourage and help others to do as well or even better than we did. With a little forethought and labor many dwellers on small city or village lots might enjoy the luxury of small fruits and crisp tender vegetables of their own growing, and at the same time beautify otherwise unsightly buildings and areas. For Lima beans no better place than the south and east sides of such buildings can be found. Make the soil rich and mellow, and when the apple trees are in bloom plant the beans (eyes down) about one inch deep and 12 inches apart. Use coarse wool twine for the vines to climb, which they will do as readily as does a morning glory. Early Siebert and King of the Garden are our favorite varieties. Grapevines and even peach trees can be trained to such a wall, by proper pruning, and securing the branches by nailing strips of leather over them.

Eight or 10 roots of rhubarb, a Spring luxury, will furnish an ordinary family an abundant supply. Linnaeus is the best for early use, though not as large as Victoria or Mammoth. An asparagus bed 3x6 feet will yield several dollars' worth each season if properly cared for, and will last for 20 years. Anyone who has tested the difference between home-grown salads and those purchased from the grocery or market will gladly give time and space to grow a few rows of lettuce, endive, chicory, dandelion, mustard, parsley, and cress. Several of these are useful as greens, and for garnishes. Raspberries, red and black; blackberries, currants and gooseberry bushes can be set close to the tight board fences which ordinarily enclose city lots, and if pruned and cared for, yield rich harvests, as well as hide the ugliness of the fence. Caring for the fruits and vegetables will keep the boys and girls off the street, and give them an interest in the home and a love for Mother Nature as nothing else can.

CHAPTER VI.

STORING VEGETABLES.

Celery. Small quantities are easily stored in trenches. These should be made where the ground is high and dry, with no danger of flooding. The trenches should be one foot in width and as deep as the stalks are high. Leave the soil in bottom of trench loose, and set the plants closely together on the loose bottom earth. Nail boards together, V-shape, and turn over the trenches to shed the water, and cover over all with straw or other litter as cold weather demands. In this way, the temperature can be controlled much more easily than by covering the trenches with straw and earth. Hotbed storage is quite common, and also convenient, provided one has the hotbeds. They can be banked with earth and covered with boards and manure sufficient to protect from both water and frost. The celery should be set closely together in upright position and never packed in piles. The hotbeds are really convenient, if they are at hand. The most convenient storage for the family supply is to pack in boxes in the cellar. Select a dark part of the cellar and use damp sand for the roots. Keep the sand moist, and considerable growth will be made, and the blanching will be perfect.

TURNIPS AND RUTABAGAS

These, like the cabbages, have so strong an odor that they are unfit for storage in the house cellar. They keep freshest and in nicest condition, if pitted; and instead of covering first with straw, cover with earth, allowing it to sift through among the vegetables all it will. Then when there is danger of too much freezing use the straw or manure, and a second covering of earth if needed. They, too, are more tender and crisp after a good freeze, but better to hold them thus than allow them to thaw and freeze again.

CABBAGE.

In storing dig a pit four feet wide and deep enough to hold four or five tiers, and any length required. A layer of straw, leaves or cornstalks perfectly dry and clean will cover the bottom to the depth of three or four inches. After cutting off the stumps and removing all outside leaves, the cabbage will be packed in tiers, stump ends upward. Above ground they will be sloped to a peak and covered with straw and earth to the depth of six to eight inches. If they freeze that will be all right, only they will then be covered with manure and more earth, to hold them in the frozen condition. Steady freezing will do no harm, but the freezing and thawing with every change of weather is what works the mischief. A dry condition and steady temperature are the essentials for safe keeping.

ONIONS.

Considerable care is necessary in storing onions to carry them over winter without loss. They should be entirely free from dampness,

when put away. Store in level condition and never in deep piles. Give plenty of air but keep in as cool condition as possible. They will keep well in frozen condition, provided they can be kept thus, until required for use. Thaw out gradually as required for use and do not allow them to freeze and thaw. At all events they should be kept cool enough to prevent growth of the tops. If freezing is attempted, let them freeze entirely through, then cover with straw, leaves or chaff thickly enough that weather changes will not affect them.

OTHER VEGETABLES.

The beets, carrots, parsnips and salsify are not at all objectionable in the cellar, but are much nicer and fresher if pitted in the loose earth. We like them best fresh from the soil in which they grew. So if some are stored in the cellar for use in the coldest weather, I prefer to cover them with garden soil right on the cellar bottom. Whatever parsnips and salsify are carried over for Spring use are best left standing in the rows as they grew, but as top growth starts early in Spring they should be taken out then, as they soon become worthless once the tops start to grow.

PUMPKINS AND SQUASHES.

There is sufficient genuine Yankee blood in our family to keep up a steady and strong demand for pumpkin pie. We have resorted to canning and drying the pumpkin, but find it more satisfactory to carry them through in their natural state. For this purpose we find the Mammoth varieties, as Potiron, Mammoth Tours, or the genuine pie pumpkins as Japanese, Tennessee Sweet Potato, Winter Luxury, etc., far more satisfactory than the ordinary field sort. We find no difficulty in carrying the above sorts through to late March in perfectly sound condition. They are all of the very best quality, and we discover but little, if any best quality in any one of them. Our only objection to the Mammoth for our own use is, that notwithstanding our keen relish for the pies and an earnest desire to do all we can, it is nevertheless asking a little too much of a family of four to tackle an 80 or 100-pound pumpkin with a view of caring for the whole of it before wasting. We have always found ready sale for them among the bakeries where larger quantities are required, and we like them very much for their feeding qualities. So we reserve the smaller varieties of the genuine pie pumpkins for our own use, and a scanty supply always gives us a lonesome, homesick feeling. We have succeeded best with the Winter supply to keep them in a cool, dry place just as long as possible without freezing. Then remove them to a dry garret beyond the danger of frost; but always with plenty of air. The Winter squashes are handled in the same way, but in either case we are careful to remove any that become affected as they always breed trouble.

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